

Remarks

Claims 1-18, 21-23, 59-78, 80-81 and 99-112 are pending in the application. Claims 1, 6-9, 12-14, 16-17, 22-23, 59, 61-62, 64-66, 70-72, 74-75, 77-78, 80 and 99 have been amended. New claims 103-112 have been added. No new matter has been added by virtue of this amendment. Reconsideration of the application as amended is requested.

Entry of the present amendment

Applicant has amended the independent and dependent claims to remove the "arrays," putting the arrays of the independent claims into the new dependent claims. Applicant also added new claims for the composition of the cleaning fluid. Support for these new claims is on page 6, line 14. Applicant believes that this amendment does not add issues for consideration and search. Therefore applicant requests entry of the present amendment.

Claim Rejections--35 U.S.C. § 112, first paragraph

The Examiner rejects claims 1-18, 22-23, 59-81, and 99-102 under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. The Examiner states that "the applicants amended the claims to recite the specific orientation of the side of the substrate, which has a conductive film thereon. Such is not supported by the original disclosure."

Applicant would respectfully ask the Examiner to consider first that the specification states:

This invention relates generally to surface cleaning of articles such as semiconductor wafers, flat panel display glass, hard disk drives and heads, and the like to remove particulate and chemical contaminants. In particular, the invention relates to megasonic cleaning of oxide, metallic, or polymer films following planarization (Chemical Mechanical Polishing, CMP) and other polishing processes (page 1 lines 11-15).

Thus, the written description provides for surface cleaning of a metallic film on a substrate. Since metals are conductive, the written description provides for surface cleaning of a conductive film on a substrate as well.

837BUS-X

Page 16 of 19

09/819,578

The specification also states:

In both FIGS. 2 and 3, the apparatus 200 includes a container 205 for holding single wafer 90 to be cleaned and for holding the liquid cleaning medium 220, and a megasonic transducer 210 disposed to face the surface of single wafer 90 to be cleaned (page 7, lines 19-22).

The Examiner states that the specification does not expressly state that the side of the substrate with the conductive film is facing the megasonic transducer. However, applicant would first respectfully ask the Examiner to consider that the specification expressly teaches having "megasonic transducer 210 disposed to face the surface of single wafer 90 to be cleaned."

Thus, if the metallic film on the substrate of page 1 line 14 is to be cleaned it would be disposed to face the megasonic transducer as described on page 7, lines 19-22.

Thus, the rejection of claims 1-18, 22-23, 59-81, and 99-102 under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement has been traversed.

The Examiner further states, "it is also noted that all independent claims recite two parallel transducers (arrays of the transducers). Such is not supported by the parent application."

Applicant has amended the independent claims to provide a "megasonic device," a term that includes "a megasonic transducer" as provided in the parent application. In addition, applicant has amended the independent claims to provide that "substantially all vibration provided in said fluid is from an active surface that is substantially parallel to said side," as also provided in the parent application. Thus, the independent claims, as amended, can claim priority of the parent application for their entire scope.

The term megasonic device also includes "an array of megasonic transducers," as provided in the CIP application, and applicant has added new dependent claims that provide that the megasonic device can be a megasonic transducer or an array of megasonic transducers. The amendment also includes vibration in the fluid coming from a pair of megasonic transducers, or a pair of arrays of megasonic transducers, that are all substantially parallel to the side, as in the CIP application.

Claim Rejections--35 U.S.C. § 103(a)

837BUS-X

Page 17 of 19

09/819,578

The Examiner rejects claims 1-18, 22-23, 59-81, and 99-102 under 35 U.S.C. § 103(a), as being unpatentable over Kanno (6199567) in view of WO 01/08200 and Matsushita (5071776).

As the Examiner notes, Kanno does not teach or suggest the apparatus as claimed including the limits of independent claims 1, 23, and 59 concerning (a) overflows on two sides of the container and (b) the substrate substantially parallel to the first active surface of the megasonic device.

Also, while Matsushita teaches overflow on two sides for some of his embodiments he does not each or suggest overflow on two sides for the embodiment of FIG. 8 or FIG. 9 that has wafers aligned parallel with the ultrasonic wave generator. In these embodiments Matsushita has a cover. The purpose of the cover is to provide reflection of sound waves so as to achieve standing waves in the tank. These standing waves are needed in Matsushita to provide the backside damage on all wafers simultaneously. Thus, Matsushita teaches overflows in embodiments that do not have parallel wafer and wave generator and Matsushita appears to teach against overflows in the embodiment with parallel wafer and wave generator.

In addition, claim 1 includes the limit, "said substrate in said container within said sidewalls and below said overflow." Matsushita similarly teaches against this limit.

In addition, claim 1 includes the limit, "flowing said fluid upwardly in said container from said container inlet, through said first spacing, and over said overflows." Matsushita also teaches against this limit.

In addition claims 23 and 59 include the limit, "providing a single substrate." Matsushita exclusively teaches batch processes. His scheme for providing standing waves would not be needed for single wafer processing. Thus, he teaches against single wafer processing.

Applicant would respectfully ask the Examiner to consider that with respect to the independent claims, as amended, applicant can now claim priority of parent application 09/655, 038 which was filed on September 5, 2000, which was a continuation of PCT US99/02686 filed August 2, 1999 which claimed priority of US provisional application 60/104,131 filed October 14, 1998. WO 01/08200 has a later effective date. Thus, WO 01/08200 should be removed as a reference with respect to all three of the independent claims, as amended.


In addition, WO 01/08200 does not teach or suggest the limits of claim 1 (a) "at least two sidewalls having an overflow," and (b) "flowing said fluid upwardly in said container from said container inlet, through said first spacing, and over said overflows."

The WO 01/08200 patent has overflow exclusively on one side, as shown in FIG. 1 by numerals 44, 45 and as acknowledged by the Examiner. The overflow appears to be controlled by adjustable edge 44. Adjustability is important to the WO 01/08200 patent. It would not be obvious how to provide common adjustment to multiple adjustable edges so that fluid would flow "over said overflows" (plural) as provided in claim 1(d). None of the references teach or suggest any reason to go to the trouble or expense of providing two adjustable overflows. It was applicant who suggested reason for providing two overflows.

Therefore the rejections of claims 1, 23, and 59, and claims dependent thereon, under 35 U.S.C. § 103(a), as being unpatentable over Kanno in view of WO 01/08200 and Matsushita has been traversed.

It is believed that the claims are in condition for allowance. Therefore, applicant respectfully requests favorable reconsideration. If there are any questions please call applicant's agent at 802 864-1575.

Respectfully submitted,
For: Busnaina


By: James M. Leas
Registration Number 34,372
Tel: (802) 864-1575

James M. Leas
37 Butler Drive
S. Burlington, Vermont 05403